

Appl. No.:
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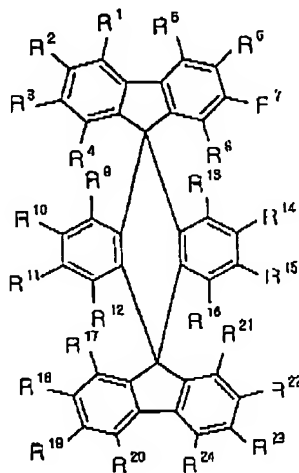
: 10/099,781
: March 14, 2002

AMENDMENTS TO CLAIMS AND PENDING CLAIMS

Please cancel Claims 23-88 without prejudice.

Please amend Claims 2, 3, 5 and 6 as follows:

1. (Original) A chemical compound of Chemical Formula I:



Chemical Formula 1

wherein R1 through R24 are substituent groups, identical or different, and wherein not all of R1 through R24 are hydrogen.

2. (Currently Amended) The chemical compound of Claim 1, wherein one or more of R1-R24 are selected from the aryl group consisting of phenyl, biphenyl, terphenyl, benzyl, naphthyl, anthracenyl, tetracenyl, pentacenyl, perylenyl, coronenyl, and heteroaryl, which are either substituted or unsubstituted.

3. (Currently Amended) The chemical compound of Claim 2, wherein the aryl groups are further substituted with one or more phenyl, biphenyl, terphenyl, benzyl, naphthyl, anthracenyl, tetracenyl, pentacenyl, perylenyl, coronenyl or heteroaryl, which are either substituted or unsubstituted.

4. (Original) The chemical compound of Claim 1, wherein one or more of the R1-R24 are selected from the heteroaryl group consisting of thiophenyl, thiazolyl, oxazolyl, imidazolyl, and pyrazinyl, either substituted or unsubstituted.

5. (Currently Amended) The chemical compound of Claim 1, wherein one or more of R1-R24 are selected from the group consisting of amines with at least one aryl substituent and aryl including phenyl, biphenyl, terphenyl, benzyl, naphthyl, anthracenyl, tetracenyl, pentacenyl,

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perylene, coronene and heteroaryl.

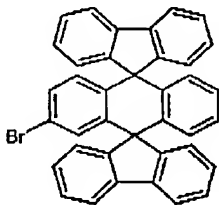
6. (Currently Amended) The chemical compound of Claim 1, wherein at least one of R1-R24 is anthracenyl or heteroaryl.

7. (Original) The chemical compound of Claim 1, wherein the substituent groups R1 through R24 can be substituted by one or more organic moieties satisfying General Formula I.

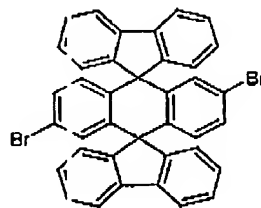
8. (Original) The chemical compound of Claim 1, wherein one or more of the R3, R7, R10, R11, R14, R15, R18, and R22 are substituted with non-hydrogen substituent groups.

9. (Original) The chemical compound of Claim 1, wherein one or more pairs of R3 and R7; R18 and R22; R10 and R15; and R11 and R14 are substituted with non-hydrogen substituent groups.

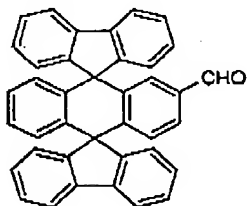
10. (Original) The chemical compound of Claim 1, wherein the compound is selected from the group consisting of Chemical Compounds 1-11, 100-137, 200-222, 300-308, and 400-413 as shown below, and wherein "Br" in Chemical Compounds 1, 2 and 5-7 may be substituted with another leaving group:



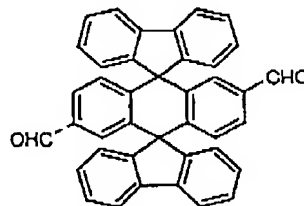
Chemical Compound 1



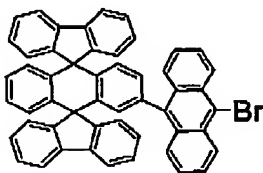
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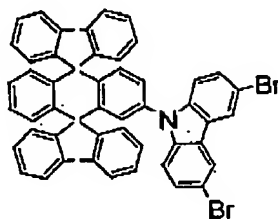
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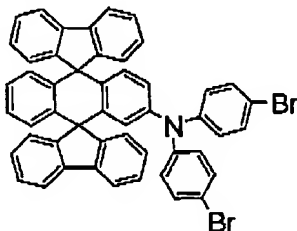
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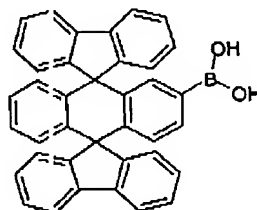
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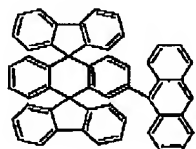
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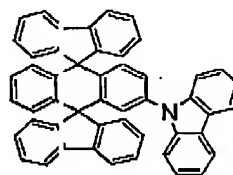
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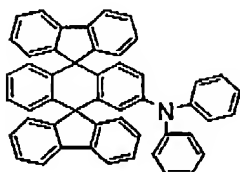
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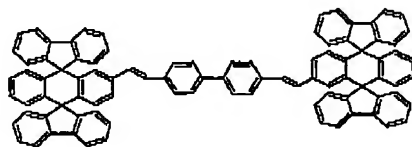
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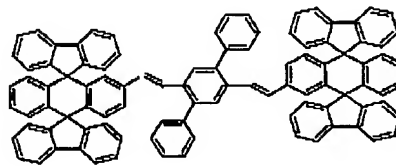
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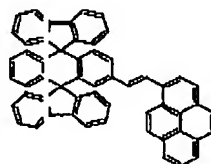
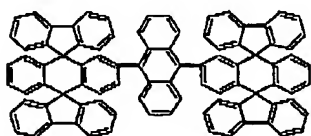
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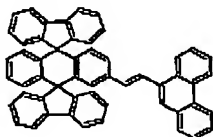


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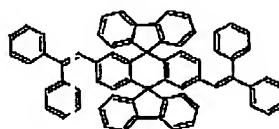


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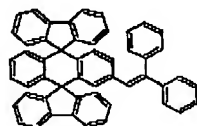
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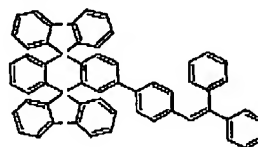
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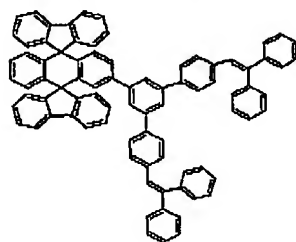
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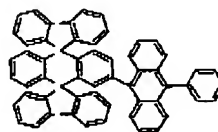
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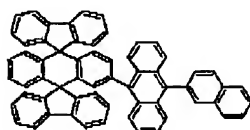
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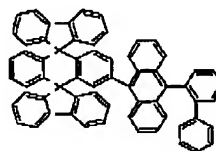
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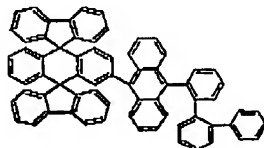
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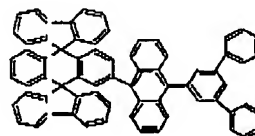
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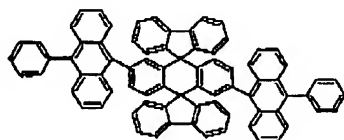
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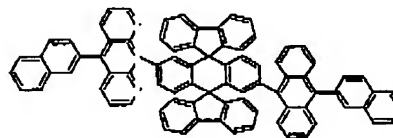
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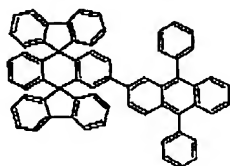


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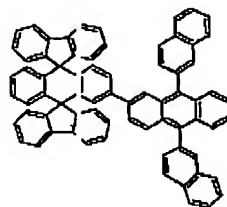


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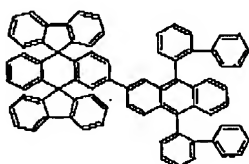
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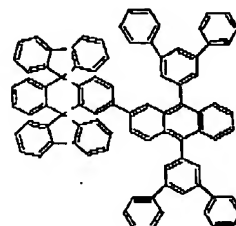
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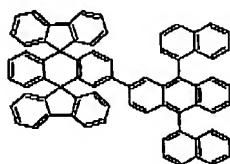
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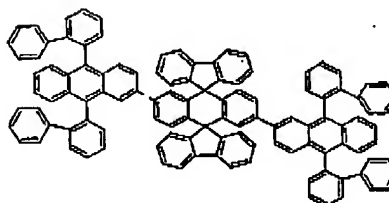
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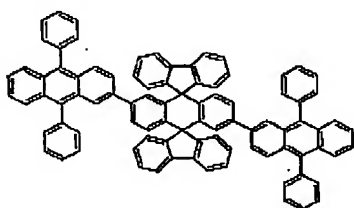
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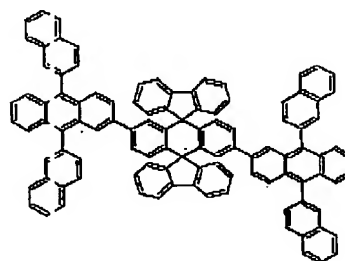
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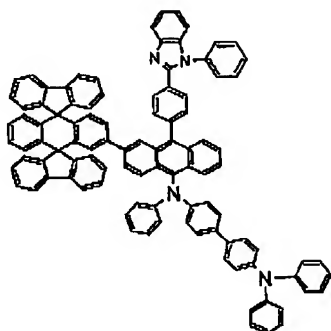
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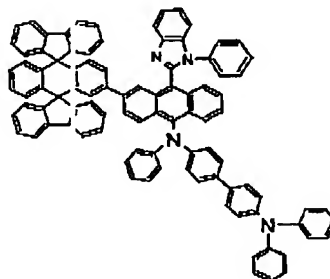
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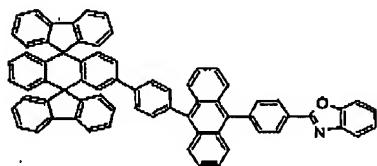
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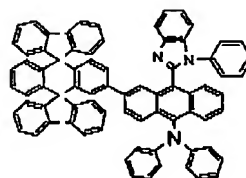
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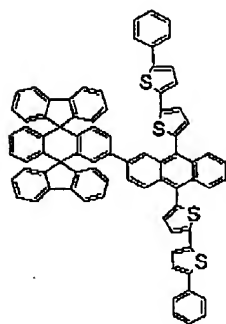
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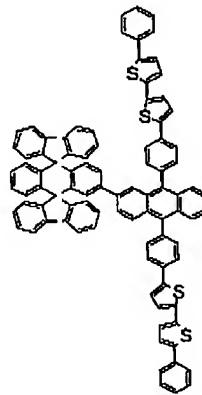
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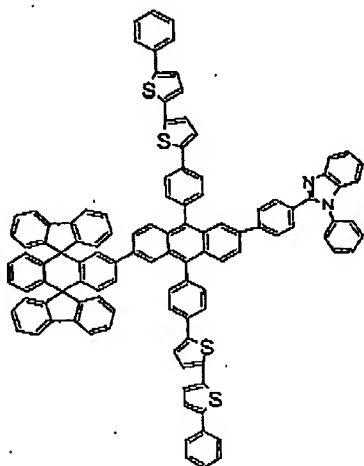
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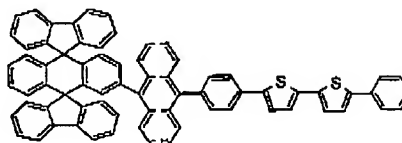
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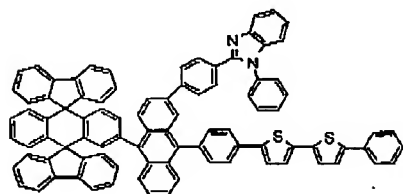
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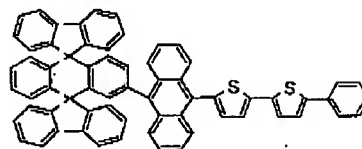
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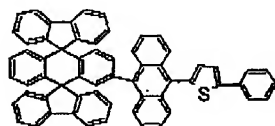
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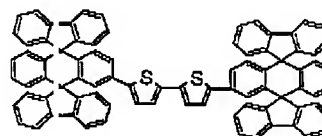
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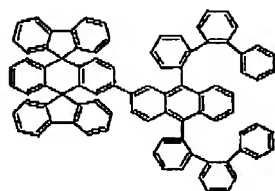
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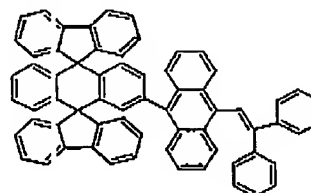
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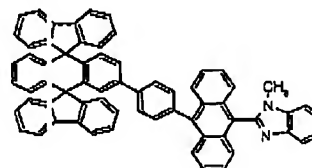
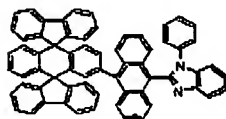
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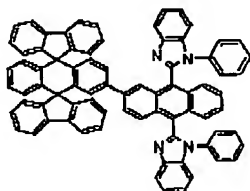


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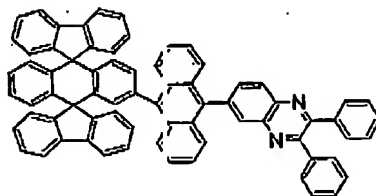


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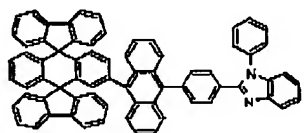
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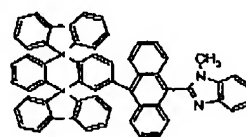
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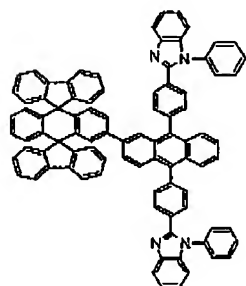
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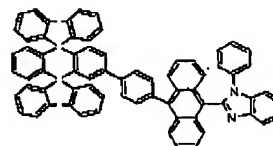
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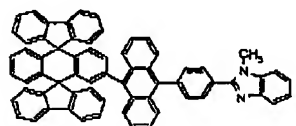
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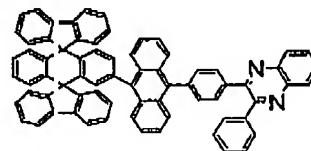
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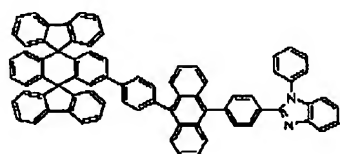
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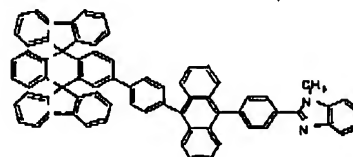
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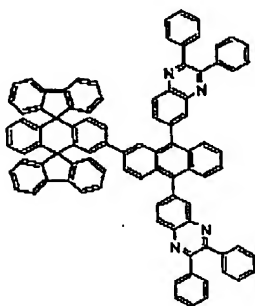


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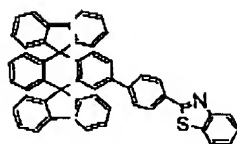


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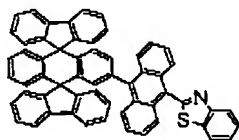
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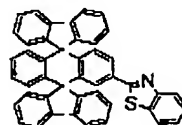
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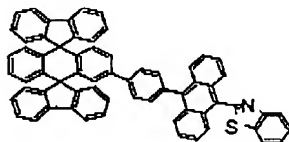
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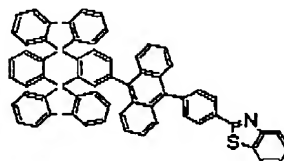
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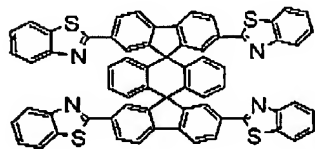
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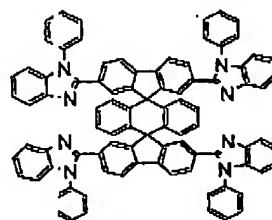
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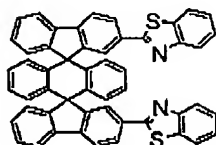
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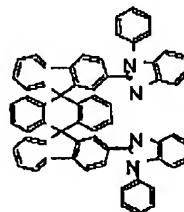
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Chemical Compound 219



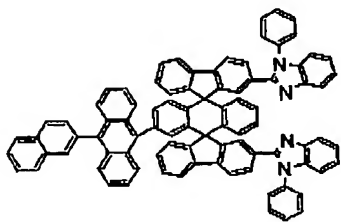
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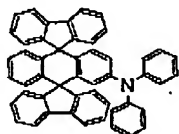
Chemical Compound 221

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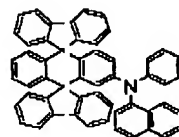
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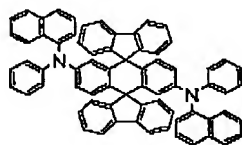
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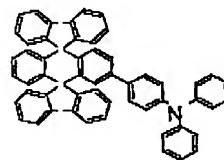
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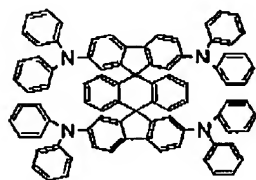
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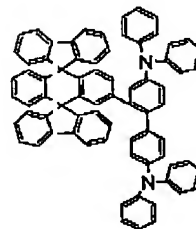
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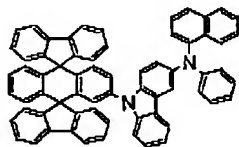
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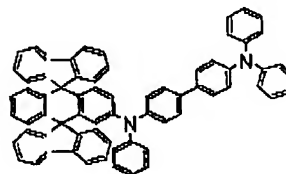
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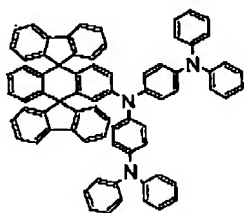
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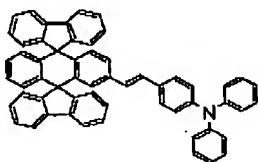
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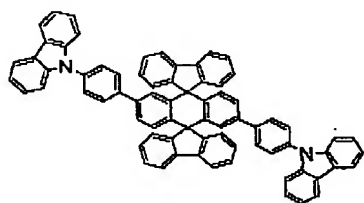
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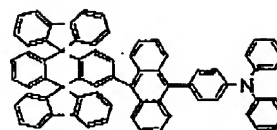
Chemical Compound 308



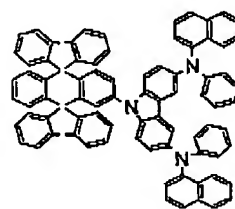
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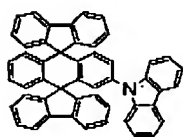
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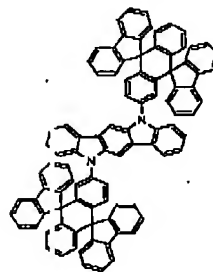
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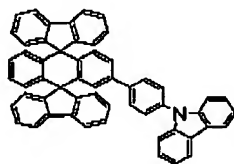
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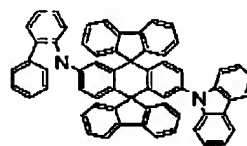
Chemical Compound 404



Chemical Compound 405



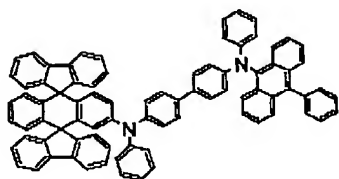
Chemical Compound 406



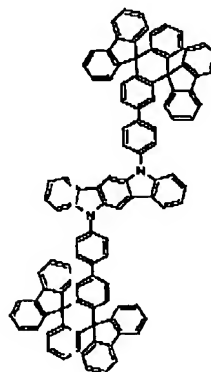
Chemical Compound 407

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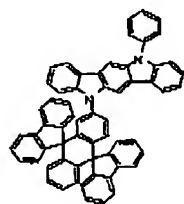
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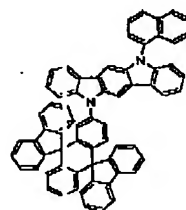
Chemical Compound 408



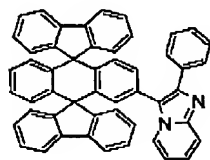
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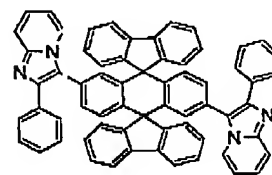
Chemical Compound 410



Chemical Compound 411



Chemical compound 412



Chemical Compound 413.

11. (Original) The chemical compound of Claim 1, wherein the compound has a melting point above about 300 °C.
12. (Original) The chemical compound of Claim 1, wherein the compound has a band-gap corresponding to visible light emission.
13. (Original) The chemical compound of Claim 12, wherein the band-gap for the visible light emission is from about 1.8 eV to about 3.5 eV.
14. (Original) The chemical compound of Claim 12, wherein the band-gap corresponds to blue, green or red light emission.
15. (Original) The chemical compound of Claim 1, wherein the compound has a hole-transporting property.
16. (Original) The chemical compound of Claim 1, wherein hole mobility in the

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compound is about $1 \times 10^{-7} \text{ cm}^2/\text{Vs}$ or greater.

17. (Original) The chemical compound of Claim 1, wherein the compound has an electron-transporting property.

18. (Original) The chemical compound of Claim 1, wherein electron mobility in the compound is about $1 \times 10^{-7} \text{ cm}^2/\text{Vs}$ or greater.

19. (Original) The chemical compound of Claim 1, wherein the compound has a hole-injecting property.

20. (Original) The chemical compound of Claim 1, wherein the compound has the highest occupied molecular orbital (HOMO) level from about -4.0 eV to about -6.0 eV.

21. (Original) The chemical compound of Claim 1, wherein the compound has an electron-injecting property.

22. (Original) The chemical compound of Claim 1, wherein the compound has the lowest unoccupied molecular orbital (LUMO) level from about -2.5 eV to about -4.0 eV.

23-88. (Canceled)

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DISCUSSION OF CLAIM AMENDMENTS

Claims 23-88 have been canceled without prejudice as being non-elected as discussed below. Claims 2, 3, 5 and 6 have been amended to correct typographical errors as set forth above. As such, no new matter has been added by the claim amendments. Entry of the claim amendments is respectfully requested. Upon entry of the amendments, Claims 1-22 are pending in this application.

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ELECTION OF INVENTION AND TRAVERSE OF RESTRICTION REQUIREMENT

In the Restriction Requirement, the Examiner indicated that this application includes different groups of claims as follows:

- Group I: Claims 1-22 drawn to chemical compounds;
- Group II: Claims 23-59 drawn to a solid deposition, and light emitting, hole transporting and electron transporting materials;
- Group III: Claims 60-62 drawn to a method for making a solid deposition;
- Group IV: Claims 63-78 drawn to an organic electroluminescence device;
- Group V: Claims 79-82 drawn to a method of generating visible light; and
- Group VI: Claims 83-88 drawn to a method of manufacturing an EL device.

Applicants elect Group I (Claims 1-22) drawn to chemical compounds.

However, Applicants respectfully traverse the restriction requirement. Noting the relationship among Groups I-VI, the Examiner contends that the restriction is proper because of separate status of the groups in the art. However, all of the claims either elected or non-elected recite Chemical Formula I or a double-spiro compound. In fact, Chemical Formula I represents a double spiro structure. In light of this, Applicants submit that the examination of all of the groups would not create unreasonable search burden to the Examiner in charge. Applicants respectfully request withdrawal of the restriction requirement.

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ELECTION OF SPECIES

Further to the restriction requirement, the Examiner requested election of species recited in various claims. Applicants respectfully respond to the requirement for election of species as follows:

R1-R24 of Claims 1-7

The Examiner requested that Applicants elect one of R1-R24 in Claims 1-7. The Examiner appeared to require election of a substituent group for Chemical Formula I rather than election of a species of the compounds represented Chemical Formula I. To clarify the issue, Applicants' representative, Paul C. Steinhardt, Registration No. 30,806 had a telephonic interview with Examiner Cynthia H. Kelly. Examiner Kelly advised Applicant's representative that election of a species of the compounds represented by Chemical Formula I would suffice this requirement for election of species. In accordance with Examiner Kelly's advice, Applicants elect Chemical Compound 110 as the species for the examination.

Chemical Compounds of Claim 10

Applicants elect Chemical Compound 110 as the species for examination.

Claims Readable on the Elected Species

Claims 1-3, 5-8 and 10-14 are readable on the elected species of Chemical Compound 110.

Election of Species Requirements for Canceled Claims

Election of species has been requested among various species recited in Claims 23-28, 44, 46, 48, 69, 75 and 77. As set forth above, Claims 23-88 have been canceled. Thus, the requirement for election of species is now moot.